Claims

1. A method for producing a synthetic protein comprising an amino acid sequence that is at least 80% identical to at least 46 contiguous amino acids of a naturally occurring antigenic protein of a pathogen or tumor, wherein the method comprises the steps of:
   a) chemically synthesizing two or more fragments each consisting of 2 – 80 contiguous amino acids of the amino acid sequence, whereby in the amino acid sequence the two or more fragments are neighbouring and non-overlapping;
   b) chemically ligating the C-terminus of a fragment to the N-terminus of a neighbouring fragment to produce the synthetic protein or a part thereof;
   c) optionally, repeating step B to sequentially ligate a further neighbouring fragment obtained from step B or step C to produce the synthetic protein.

2. A method according to claim 1, wherein the neighbouring non-overlapping fragments are selected to comprise a N-terminal cysteine or glycine residue.

3. A method according to claims 1 or 2, wherein the naturally occurring protein is an HPV protein.

4. A method according to any one of claims 1-3, wherein the HPV protein is an E2, E6 or E7 protein from HPV16, HPV18, HPV31, HPV33 or HPV45.

5. A method according to any one of claims 1-4, wherein the synthetic protein obtained from step B or C is chemically conjugated to an adjuvant.

6. A method according to claim 5, wherein the adjuvant is chemically synthesized.

7. A method according to claims 5 or 6, wherein the adjuvant is capable of activating dendritic cells.

8. A method according to claim 7, wherein the adjuvant is selected from the group consisting of polyIC, CpG DNA, imiquimod, Pam3Cys, LPS and combinations

thereof.

9. A method according to any one of claims 1-8, further comprising the step of formulating the synthetic protein into a pharmaceutical composition by mixing the protein with a pharmaceutically acceptable carrier.

10. A composition comprising a synthetic protein, the protein comprising an amino acid sequence that is at least 80% identical to at least 46 contiguous amino acids of of a naturally occurring antigenic protein of a pathogen or tumor, whereby the composition is free of a nucleic acid encoding the amino acid sequence.

11. A composition according to claim 10, wherein the protein comprises an amino acid sequence that is at least 80% identical to at least 46 contiguous amino acids of one of SEQ ID's No. 1 to 6, whereby the composition is free of DNA encoding the amino acid sequences of SEQ ID NO 1-6.

12. A composition according to claim 11, whereby composition further comprises an adjuvant.

13. A composition according to claim 12, wherein the adjuvant is capable of activating dendritic cells.

14. A composition according to claim 13, wherein the adjuvant TLR-activating adjuvant is selected from a group consisting of polyIC, CpG DNA, imiquimod, Pam3Cys, LPS and combinations thereof.

15. A composition according to any one of claims 10-14, whereby the adjuvant is covalently conjugated to the protein.

16. A composition according to any one of claims 9-15, whereby the composition further comprises a pharmaceutically acceptable carrier.

17. A composition according to any one of claims 9-16, whereby the composition further comprises anti-CD40 antibody.

18. A composition according to any one of claims 9-17 for use as a vaccine.

19. A method for the treatment or prevention of an HPV associated disease, the method comprising the administration to a subject of a synthetic protein produced as defined in claims 1-9, or a composition as defined in claims 10-18, in a therapeutically effective amount.

20. A method according to claim 19, wherein the HPV associated disease is an HPV-induced cancer.

21. Use of a synthetic protein produced as defined in claims 1-9, or a composition as defined in claims 10-18, for the manufacture of a medicament for the treatment or prevention of an HPV associated disease.

22. A use according to claim 21, wherein the HPV associated disease is an HPV-induced cancer.